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IMPACT OF MACROECONOMIC VARIABLES ON STOCK MARKET VOLATILITY: A CONCEPTUAL REVIEW

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Abstract
In this research paper, attempt has been made to explore the relation especially the causal relation between stock market index i.e. NSE Sensex and three key macro-economic variables of Indian economy. It is concluded that, Indian stock market is approaching towards informational efficiency at least with respect to two macroeconomic variables, viz. exchange rate and inflation (WPI). A large attention is being paid on various factors which impact stock market. Despite the growing literature on impact of variable on stock market, little effort has been done devoted to synthesize the overall state of art on the topic. In this paper, an attempt is being made to review the status of literature on impact of macroeconomic variables on stock market, thus to find research gap. A literature review scheme is presented. Based on review, suggestion for further research is likewise provided.
Keywords: Macroeconomic variables; National Stock Exchange; Efficient Market Hypothesis; Indian Economy

Introduction:

Stock markets' exposure emanating from dynamics of cogent variables and investors' behaviour is gaining significance due to the function of these markets in mobilization and channelization of capital towards productive activities. As a protocol of wealth creation, investment activities executed by diverse groups in the stock market are crucial to economic development and, both developed & developing economies are intensely pegged with the performance of their stock markets. Besides, the proliferation of techno-driven information sharing architecture has substantiated the dissemination of both ex-ante & ex-post information pertaining to endogenous as well as exogenous issues which in turn lead to intricate and intermingle relationships among variables of economy and stock market.

Indian economy has witnessed a complete turnaround during the last two decades in all facets and emerged as one of the fast-growing economies of the world attracting attention of diverse stakeholders. The quantum of capital investment and high saving rates has significantly contributed to such healthy state which made it a heaven for transnational entities looking for lucrative destinations. Conversely, Indian market has experienced the spill-over effect of global financial crisis and unexpected capital flow resulting from unwinding of investments causing

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fluctuations in macroeconomic variables. Multinational players are adopting cautionary approach and cautiously analyzing movements in all cogent economic variables to better execute their investment activities in Indian market.

Moreover, the stock markets are becoming an integral part of the economies of many countries and this fact that stock market indices have become an indication of a healthy economy of a country asserts the importance of stock market. It is said that the stock market is a critical element in the wheel that smoothens the transfer of funds for economic growth. Broadly speaking, a prior knowledge of the sensitivity of the stock market to the macroeconomic pattern of the key economic variables and vice versa is very important in many areas of the investment and finance. A depth understanding of the macro economic variables and its dynamic can be valuable for the traders, investors and also for the policy makers of the country.

The stock market indices are influenced by an array of factors like microeconomic & macroeconomic variables, company specific and sector specific environment in which the company is functioning. Among all the factors, macroeconomic variables are pivotal and become an attractive and coveted subject for both the financial and macroeconomist for a long period of time. At present, the dynamic relationship between stock market and different macroeconomic variables has become a long and ardently debated issue amongst the academicians and professionals. In this connection, quite a lot of empirical studies have revealed conflicts among their inferences drawn about this polemic issue; that sometimes changes in stock prices affect the macroeconomic variables and sometimes the changes in the macroeconomic variables reflects the performance of the stock market. The relationship regarding this formidable matter can be understood from either of the ways – the first relation states that stock market leads the economic activity, whereas the second case suggests that it follows the economic activity. A large number of studies have failed to establish any well-defined association between the stock market and the macroeconomic variables. Moreover, many of the studies are subject to the serious criticisms and the results drawn from such studies are not affluent enough and beyond question.

Objectives of the study

The objectives of the research are:

1. To identify the factors affecting the volatility in stock market through review of literature.
2. To analyse the relationship between the volatility in share market and GDP growth rate.

Research Methodology

It may be internal to the firm or may be external to the firm as published data or commercially available data. Books of records, literatures, research papers, journals, magazines and website are the sources through which the data collected for this research.

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Review of Literature

Ullah, G. M. W., Islam, A., Alam, M. S., & Khan, M. K. (2017) finds that stock market is one of the most widely followed markets in the world with a horde of transactions facilitated every day. Thus, not surprisingly a plethora of research has been dedicated to understanding the nature of these markets and what factors affect their movements and performance in general. Several studies have postulated that macroeconomic variables do tend to significantly affect stock market performance, while other studies found inconclusive relation at best. It is also worth noting that most of these studies were conducted on developed markets and rarely touched on the developing markets. On this background, the objective of this study is to examine the significance of macroeconomic variables in effecting stock market performance of SAARC countries using the OLS multiple regression Model. We have used annual data for the period 2005-2015. The findings of the study showed that macroeconomic variables i.e. exchange rate; foreign currency reserve and interest rate are all statistically significant in affecting stock market performance of SAARC countries. Whereas, inflation and money do not have a significant relationship in affecting stock market performance.

Jamaludin, N., Ismail, S., & Ab Manaf, S. (2017) in their paper aims to examine the effect of macroeconomic variables namely inflation, money supply (MS), and exchange rate (ER) on both conventional and Islamic stock market returns in the three selected ASEAN countries (Singapore, Malaysia, Indonesia) by utilizing monthly data over the period of January 2005 to December 2015. Applying the panel least square regression techniques, the results show that both stock market returns are significantly affected by the ER and inflation rate. MS is found to be insignificant. The findings of this paper also conclude that inflation poses a greater effect and inversely related to the stock market returns. In this case, there is a need for amendment in monetary policy to ensure that inflation rate is set at a low level, since the results would be able to bring an impact to boost the capital market in the selected ASEAN countries.

Chandrashekar, R., Sakthivel, P., Sampath, T., & CHITTEDI, K. R. (2018) aim to explore the role of the macroeconomic variables and stock prices for emerging economies perspective. Further, the study examines the association between the macroeconomic variable and stock prices across the panel of India and Brazil. The study utilizes monthly data from 2000M1-2016M08. We employ various panel econometric techniques. The findings confirm that the long run relationship between variables and unidirectional causality. The results also reveal that GDP, inflation, exchange rate, interest rate and stock prices play an important role in economic development.

Ndlovu, B., Faisa, F., Resatoglu, N. G., & Türsoy, T. (2018) assessed association of macroeconomic variables: inflation (INF), Money supply growth (M3), Interest rates (IR) and USD ZAR exchange rate (EX) using quarterly data from the year 1981Q1 to 2016 Q4 on stock price for the Johannesburg Stock Exchange South Africa. The study employed co-integration

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tests, vector error correction model, a variance decomposition and an impulse response function to understand the relationship of the variables. In the long run, interest rates, money supply and inflation have a positive relationship with the share price while the exchange rate have a negative effect to the stock prices. Unidirectional causality was found running from exchange rates and interest rates to the share price and also the interest rates and the exchange rates have a causality to the money supply. The variance decompositions established that shocks to the share price account for majority of the changes in itself for all periods during the shortrun and long-run while also cementing results of the causality shocks in the stock price and exchange rate shocks have an impact on changes in themselves, also the impulse response function further confirmed causal relationships between the variables and the stock price.

According to **Khan, J., & Khan, I. (2018),** investment decisions are highly influenced by macroeconomic variables as changes in macroeconomic variables effect stock markets differently according to the country economic conditions and government policies. The study contributes by determining the effect of various macroeconomic variables on stock prices of Pakistan by analyzing the monthly data from May 2000 - August 2016. As all the variables are stationary at first difference thus ideal ARDL approach of bound testing is applied to check the short term and long-term integration of the macroeconomic variables on stock prices. The findings suggest that stock prices of Karachi Stock Exchange in long term are significantly affected by money supply, exchange rate, and interest rate. In short term all the variables are insignificant except exchange rate which is negatively cointegrated with stock prices. The central bank shall be vigilant while changing the money supply in market because too much increase in money supply could affect investment as well as stock market. The regulator should keep interest rate relatively low to encourage economic activities, improve external economic environment through rule-based exchange rate policy and avoid discretionary measures.

Yadav, M. P., Khera, A., & Mishra, N. (2021) investigates the relationship between the Indian stock market price behaviour and macroeconomic variables. The proxy for the Indian stock market is the BSESENSEX while Foreign Reserve, Exchange Rate (Indian vs. US Dollar) and CPI are proxies for the macroeconomic variables. The Johansen Cointegration Test and the Vector Error Correction Model (VECM) on monthly data collected from websites of Reserve Bank of India and Bombay Stock Exchange within the time period of January 2000 and February 2020 have been applied. The researcher observed a contradiction between the results of trace statistics and the maximal eigenvalue of the Johansen Cointegration. The trace statistics of cointegration allude to the long-run association between the Indian stock market and its constituent macroeconomic variables. The VECM is then applied to examine the long-run and short-run causalities and the results reveal the same. This study has profound implications for investors to diversify their portfolio, considering the impact of the constituent selected macroeconomic variables in the short run and long run.

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Lone, U. M., Darzi, M. A., & Islam, K. U. (2021) seeks to examine the impact of select macroeconomic variables on stock market performance in the BRICS economies. The study has used monthly data over the period 2011–2021. The study has employed both ARDL bounds testing model and PMG/ARDL model to measure the short and long-run relationships. Both the models provide the confirmatory results regarding short as well as long-run relationships for all the BRICS economies excluding South Africa. Also, the variables have been found to be causally related with each other during the sample period. The study has implications for policymakers, regulators, academia and investors.

According to **Elangkumaran, P., & Navaratnaseel, J. (2021)**, one of the most enduring debates in economics is whether financial development causes economic growth or whether it is a consequence of increased economic activity. Financial markets play an important role in the process of economic growth and development by facilitating savings and channelizing funds from surplus unit to deficit unit. Stock market plays a significant role in the economic development of a country. A number of studies have been investigated on the causal relationship between economic indicators and stock exchange prices. Many studies have been made from time to time; however, after post war to find out the causal relationship between the economic variables and stock prices is vital to the policy makers. There are many factors which influence the stock market and ASPI. This study is focused on that how macro-economic variables influence the stock prices of CSE in Sri Lanka. For the reason four macro independent variables i,e Interest Rate (IR), Exchange Rate (ER), Balance of Payment(BOP) and Gross Domestic Product (GDP) were taken under consideration to measure influences of these factor on dependent variable of All Share Price index(ASPI). For analysis, secondary data was taken for 20 years from 1993 up to 2012.Yearly data was used considering all of the variables. Excel sheet was used to arrange the Data and SPSS was used to analyze the data. The findings revealed that GDP is significantly strong positive correlation with ASPI. Further there is a significant positive correlation between ER and ASPI whenever negatively correlated with IR. Finally, multi regression analysis indicates that macroeconomic variables significantly impact on stock prices.

Odiche, W., & Udeorah, S. F. (2020) evaluates the dynamic influence of activities of macroeconomic variables and stock performance in Nigeria from 1986 to 2015. The study utilizes secondary data sourced from the central bank of Nigeria's statistical bulletin. The study utilized data techniques of the unit root test, Ordinary least square, the Johansen co-integration, the Pairwise Granger causality test, and the error correction model. It was discovered that there is an existence of long-run relationships among market capitalization and macroeconomic variables proxies with inflation rate, interest rate, exchange rate, and money supply account for approximately 77% variations in market capitalization in the long run. The parsimonious error correction model which is rightly and significantly signed with a co-efficient of -0.484794 is an indication that over 48% variation in market capitalization can be corrected over a year using our selected independent variables. The Granger causality test

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reveals that there is no bidirectional relationship among any of our independent variables and market capitalization; it was thus recommended that due to the influential role of inflation on stock market performance public authorities should implement policies which will curb inflation rate and poverty level through infrastructural development and improved the standard of living. Also, the interest rate should be made moderate to encourage investment and transactions in stocks in Nigeria capital market and the central bank of Nigeria should formulate and use instruments that will maintain inflation at a reasonably low level so that it will not erode the real values of stocks gains.

According to **Majumdar, A., & Saha, A. (2018)**, the economic health of a country is reflected by the performance of its stock market. The Bombay Stock Exchange and National Stock are the two major stock indices of India. The National Stock Exchange (NSE) which was established in the year 1992 is the most important stock exchange in India. Nifty 50 or simply called Nifty is the flagship index of NSE. The performance of Nifty reflects the financial health of the Indian economy. Nifty is a collection of fifty companies from various sectors of the Indian economy. All the fifty company shares perform simultaneously in the market and therefore the net impact is an aggregate impact of all the fifty shares as a whole. Volatility is one of the important factors that are to be considered while pricing. The movement of the stock market is known as volatility. There are many factors which influence the volatility of the stock index. The objective of the present study is to analyse some of the selected factors which influence the volatility of Nifty during the period 2006–07 to 2016–17. Crude Oil prices, Gold price, US$/INR exchange rate, Cash Reserve Ratio, Wholesale Price Index, Call Money Rate, Foreign Direct Investment, and Foreign Exchange Reserve have been identified as those factors which are likely to have an impact on Nifty.

Khalid, W., & Khan, S. (2017) empirically investigates the effects of interest rates, exchange rates and inflation rates on stock market performance of Pakistan by using annual time series data covering the 1991-2017 periods. The prime intention of this research was to inspect the long-run and short-run relationships between the KSE-100 index and macroeconomic variables by employing the econometric techniques of autoregressive distributed lag (ARDL) bounds testing procedure to cointegration and the Error Correction Model (ECM), respectively. By applying the ARDL model, the empirical results revealed the fact that there was a negative and significant impact of interest rate on the market index, whereas; the exchange rate and inflation rate have a positive impact on stock market volatility in the long-run.

Alam, N. (2017) examines the impact of the macroeconomic variables on the stock prices in India. To fulfil the objective of the study monthly data of inflation, short-term interest rate, long-term interest rate, index of industrial production, exchange rate, money supply, and the stock indices of CNX Nifty and BSE SENSEX were collected from March 2005 to April 2013. Heteroscedastic cointegration approach was employed using a Johansen test of cointegration,

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OLS and GARCH (1, 1) model to find out the long-term relationship between the selected macroeconomic variables and the stock prices. It is evident from the study that there exist the long-term heteroscedastic relationships between the stock prices and the macroeconomic variables chosen for the study. Further, it is also evident from the study that while INF, MSE and the IIP are positively related to the stock prices, the SIR, LIR and the EXR are negatively related to the stock prices.

Singh (2010) examined causal relationships between macroeconomic variables and Indian stock markets. He considered three macroeconomic variables, IIP, WPI and exchange rates. He applied Granger causality test for this purpose. He found that IIP was the only macroeconomic variable causing changes in SENSEX.

Dash and Rao (2011) found that the APM did not have significant better explanatory power over the CAPM for Indian capital markets. Apart from the market factor, they found that interest rates (the MIBOR factor) have a significant role to play in influencing asset returns; but the market factor was found to be the most influential of the factors, more than twice as important as interest rates.

Pal and Mittal (2011) investigated the relationship between the Indian stock markets and macroeconomic variables using quarterly data for the period January 1995 to December 2008 with the Johansen's co-integration framework. Their analysis revealed that there was a long-run relationship exists between the stock market index and set of macroeconomic variables. The results also showed that inflation and exchange rate have a significant impact on BSE Sensex but interest rate and gross domestic saving (GDS) were insignificant.

Pramod Kumar Naik and Puja Padhi (2012) observed bidirectional causality between industrial production and stock prices, unidirectional causality from money supply to stock price, stock price to inflation and interest rates to stock prices. The authors conclude that macroeconomic variables and the stock market index are co-integrated and, hence, a long-run equilibrium relationship exists between them.

Narayan and Narayan (2012) investigated whether U.S. macroeconomic conditions (specifically, the exchange rate and the short-term interest rate) have effects on seven selected Asian stock markets—namely, China, India, the Philippines, Malaysia, Singapore, Thailand, and South Korea—using daily data for the period 2000–2010. They divided the sample into a pre-crisis period (pre-August 2007) and a crisis period (post-August 2007). They found that in the short run, the interest rate has a statistically insignificant effect on returns in all countries, except for the Philippines during the crisis period, and that depreciation has a statistically significant and negative effect on returns in all countries except China (regardless of the crisis). With respect to long-term relationships among the variables, although the authors found cointegration in the pre-crisis period for five of the seven countries (India,

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Malaysia, the Philippines, Singapore, and Thailand), they found no such relationship during the crisis period, implying that the financial crisis has actually weakened the link between stock prices and economic fundamentals.

CONCLUSION

In the last few decades, the growing research interest in and importance of impact of macroeconomic variables on stock market has engendered a plethora of contributions on this topic. This paper has attempted to provide a picture of body of researches produced in the field of impact of impact of economic variables on stock market during the period. Firstly, the researchers can conclude that most variable covered are inflation, exchange rate, IIP, GDP/GNP, money supply, interest rate, treasury bills. Also most researches are done on developed nations' or developing nations' stock indices like US, Great Britain, China, India, Singapore.

Thus research gap is found that still underdeveloped nations and developing nations like Bangladesh, Afghanistan, Nepal, African nations' etc. can be covered with variables like Imports, Silver, different commodities traded, purchasing power parity, Total Reserves, Tax Reserves, Revenues, Expenditures which are least covered or not at all covered. Thus large number of researches can still be done on the same topic but different variables and on different stock markets.

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